October 2003

Thailand: Environmental Issues

Introduction

In addition to abruptly halting Thailand's decade-long economic boom, the 1997 financial crisis that swept across Asia focused attention on the negative environmental effects of Thailand's rapid industrialization. While Thailand, as one of the "East Asian tigers," was lauded for its strong economic growth during the expansion years, the country also suffered from increased levels of industrial wastewater, a dramatic rise in domestic sewage and hazardous wastes, and severe degradation of its water and coastal resources. Increased levels of air and water pollution and and the loss of natural habitats--primarily due to deforestation--were some of the most visible negative environmental consequences of Thailand's unrestrained growth.

As Thailand's economy continues to recover from the effects of the 1997 financial crisis, more attention is being focused on the country's environmental problems. The country's return to economic growth has brought with it renewed threats to Thailand's environment, but there is increased awareness that Thailand's economic development must take into greater account the environment in order to be sustainable in the longer-term. The Thai government hopes that a stronger commitment to environmental protection will help the country deal with the environmental challenges that it now faces.

Air and Marine Pollution

Air and water pollution are two of the biggest environmental problems in Thailand. As such, the Thai government is taking steps to clean up damage that has already been done and attempting to implement policies geared to prevent further pollution from taking place.

Air Pollution

Thailand's most significant environmental threat is that of urban air pollution, and the capital city of Bangkok stands out as the worst among urban areas in Thailand in the country. In 1992, the United Nations Environment Program (UNEP) reported that the Thai capital was one of the most air-polluted cities in the world due to the city's notorious traffic problems. Approximately one million Bangkok residents are thought to suffer from allergies and respiratory problems due to air pollution. In 2001, airborne particulate matter was estimated to have caused 3,300 premature deaths and to have led to almost 17,000 hospital admissions, at a total health care cost of up to $6.3 billion.

Approximately 350 miles north of Bangkok, the area surrounding the 2.6-GW capacity Mae Moh thermal power plant complex has recorded a large number of deaths from heart failure and a high occurrence of chronic respiratory problems. The excessive levels of sulfur dioxide (SO2) being emitted in the Mae Moh valley can be attributed to 13 coal-fired power plants at the complex. There have been several notable environmental incidents involving the complex, including one instance in 1992 when excessive SO2 emissions from the power plants sent more than 1,200 villagers to the hospital. The Electricity Generating Authority (EGAT) has responded with the installation of sulfur scrubbers and has promised to take further remedial actions at its other sites.

However bad it is now, the signs are improving, as the Thai government has moved to take steps to address the air pollution problem. Thai Prime Minister Thaksin Shinawatra has promised a tough stance on pollution, warning that polluting industries that failed to make efforts to meet environmental regulations would face closure. The government and citizens of Thailand also have initiated a number of programs to improve the quality of air, including a project aimed at curbing the emissions of thousands of motorcycles and buses in the Bangkok Metropolitan Region (BMR). In a further effort to reduce the level of traffic and air pollution, the city of Bangkok built an elevated rail system. Yet, with 500-plus new vehicles hitting the streets of Bangkok each day, traffic congestion is once again on the rise, despite government efforts to tackle the issue.

A December 2002 World Bank environmental report said that air quality in Thailand has actually improved significantly in the past decade, and that Bangkok's air is now rated ahead of Beijing, Jakarta, New Delhi and Manila (although still worse than Hong Kong, Singapore, Taipei and Tokyo, according to the report). In the Thailand Air Quality Environment Monitor 2002, environmental engineers from the World Bank found that lead, dust and carbon monoxide in Bangkok and other urban centers had decreased to an acceptable level. The World Bank praised the Thai government's policy on phasing out leaded gasoline, improving diesel quality, and using clean technology to reduce pollution.

Thailand still needs to do more on the problem of fine particulate matter (PM), however. The so-called PM10--dust with a diameter of less than 10 micrometers--can enter the respiratory system, causing allergies, lung cancer and heart disease. PM10 in the air comes mainly from diesel engine emissions and open fires. However, the Thai government is taking steps to attack this as well, with Thailand's Environment Ministry planning to impose a ban on smoke-belching diesels in Bangkok, with mandatory inspections on all routes starting in December 2003. Owners of smoking vehicles would get 30 days to repair and re-inspect. A more aggressive policy in targeting and penalizing the most blatant violations would cut down on emissions, and there are recommendations to halt all open burning, especially in the cities, as the burning of refuse sometimes produces toxic smoke.

Still, as a result of Thailand's move from leaded to unleaded gasoline, as well as its introduction of premium unleaded gasoline, ambient lead levels in 2001 were more than 20 times lower than 1991 levels. In addition, Thailand is looking to establish new emission standards for car engines through the introduction a new law in early 2004 requiring lower sulfur content in gasoline. Thailand's pollution control department favors tax incentives for lower-sulfur diesel (ULSD) and gasoline. According to a report in the Bangkok Post, initially, the scheme would reduce consumer costs for 150-ppm sulfur fuels, a "first step" toward cutting sulfur to ultra-low levels (less than 50-ppm soulful ULSD). Surachai Thalearngchoke, secretary general of the Thai Industrial Standards Institute, has said the new standards will be in line with European emission control levels.

Marine Pollution

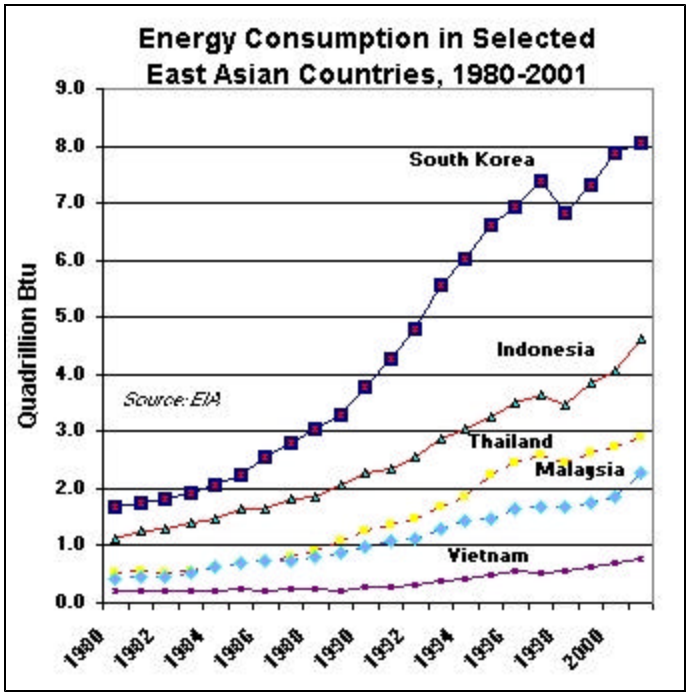
Marine pollution is considered a severe threat to the health of Thailand's people as well as its economy. Agricultural run-off, coastal aquaculture, industrial effluents and domestic sewage are responsible for the pollution of coastal, surface and groundwater in Thailand. Water pollution is most severe in the BMR due to the high concentration of industrial activity; however, areas all over the country have been affected by current water use trends.

As a result of rapid coastal development, it has been estimated that more than half of all mangrove forest areas in Thailand have been depleted. Although agriculture is considered to be the primary factor behind this, expansion of marine-based activities such as offshore oil and gas exploration in the Gulf of Thailand is expected to increase the risk of marine pollution in Thailand. Indeed, a planned 140-mile offshore gas pipeline, designed to carry gas to southern Thailand from the

Malaysia-Thailand Joint Development Area along the two countries' maritime border, has been the focus of vehement environmental opposition. Construction of the pipeline, along with a two-unit gas separation plant at a point along the pipeline in the Songkhla province, has been delayed by strong opposition from Thai environmental groups worried about the risks of further marine pollution.

Energy Consumption

Thailand's energy consumption has been growing at a phenomenal pace since 1980. In 2001, the country's energy consumption was 2.90 quadrillion Btu (quads), nearly six times higher than just two decades previously, when Thailand consumed just over 0.5 quads. Strong economic growth and the rapid industrialization of the "East Asian tigers" was both the cause and effect of huge increases in energy consumption across the region, as South Korea, Indonesia, and Malaysia all experienced similar increases in their energy consumption levels.



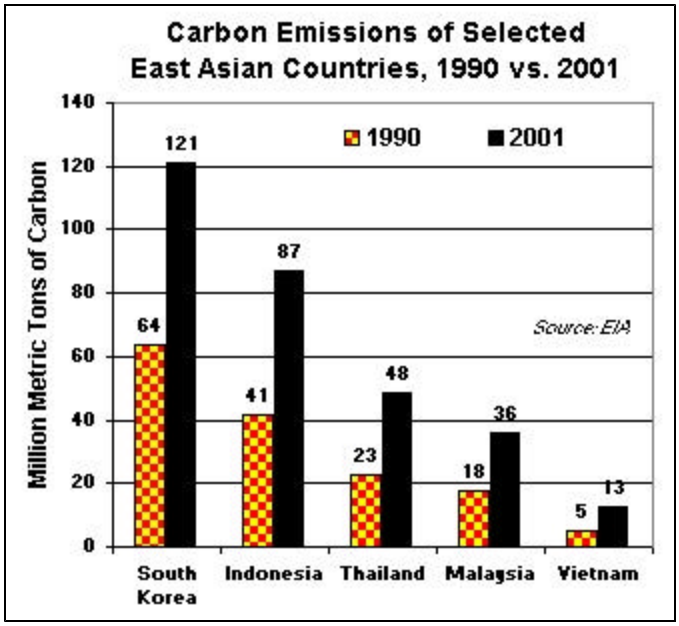
Although the 1997 Asian financial crisis saw energy consumption in Thailand and East Asia decline, the reduction has proven only temporary, as growth in energy consumption across the region has resumed. Thailand accounted for just 0.7% of the world's energy consumption in 2001, but this was up from only 0.2% in 1980 - a growth rate that environmentalists have deemed unsustainable. In terms of per capita energy consumption, Thailand has more than quadrupled the amount of energy consumed per person, from 11 million Btu per person in 1980 to 46.2 million Btu per person in 2001. Likewise, Indonesia and Malaysia have more than tripled their energy consumption per person since 1980, while South Korea has nearly quadrupled its per capita energy consumption during the same time period.

While Thailand's energy consumption growth continues to grow unabated, the country at least has diversified its sources of the energy it is using, especially with the growth in natural gas consumption. In 1980, petroleum accounted for 94% of Thailand's energy consumption, with coal and hydroelectricity both responsible for 3%. In 2001, while petroleum still was Thailand's major source of energy, its percentage of Thailand's overall energy consumption mix was down to 56%, with natural gas consumption increasing virtually from zero in 1980 to 28% of the country's total energy usage in 2001. Coal (13%) accounted for an increased proportion of the country's energy consumption, while hydroelectricity (2%) and solar and wind energy made up 1% of Thailand's total energy usage in 2001.

Carbon Emissions

Thailand is a non-Annex I country under the 1997 Kyoto Protocol, meaning it has no binding obligation to reduce its carbon emissions. In 2001, the country emitted approximately 48 million metric tons of carbon equivalent--more than twice its carbon emission level in 1990, the baseline year for the group of mostly industrialized countries that are required to reduce their greenhouse gas and carbon emissions by an average of 5.2% between 2008 and 2012. Thailand's carbon emissions

rose rapidly in the early and mid-1990s in line with increases in the country's gross domestic product (GDP), but the emissions growth rate halted abruptly with the Asian financial crisis in 1997. Thailand's pattern of carbon emissions growth since 1990 has been mirrored by South Korea, Indonesia, Malaysia, and Vietnam, all of which have doubled or nearly doubled their carbon emissions during that time.



With Thailand's recovery from the effects of the 1997 financial crisis, the country's carbon emissions rose again in 2001 after four years of remaining relatively stagnant. Still, Thailand accounted for just 0.7% of the world's total carbon emissions in 2001, and and the Thai government is committed to keeping a lid on the country's carbon emissions. Bangkok, positioned on a low-lying coastal area, is considered to be one of the most vulnerable capital cities to a rise in sea level, a phenomenon possibly associated with global warming. Thus, on August 28, 2002, Thailand ratified the Kyoto Protocol.

However, in a first, the Thai government rejected foreign assistance under the Clean Development Mechanism (CDM), which allows wealthy countries to more easily reach their emission reduction targets by investing in technology and forestation projects in developing countries. Thailand stands to benefit under such carbon credit projects under the CDM, but the Thai government said that it felt that industrialized countries should reduce their own emissions rather than operating the carbon-trading scheme. Opposition parties have called on the Thai government to reverse its decision to reject foreign assistance under CDM, while officials from the United Nations Environment Programme (UNEP) have argued that, rather than rejecting CDM out of hand, the Thai government should establish a committee to screen projects on a case-by-case basis. Thanavat Junchaya, regional network coordinator of UNEP, said that Thailand could benefit from some projects, particularly those involving renewable energy.

Energy and Carbon Intensity

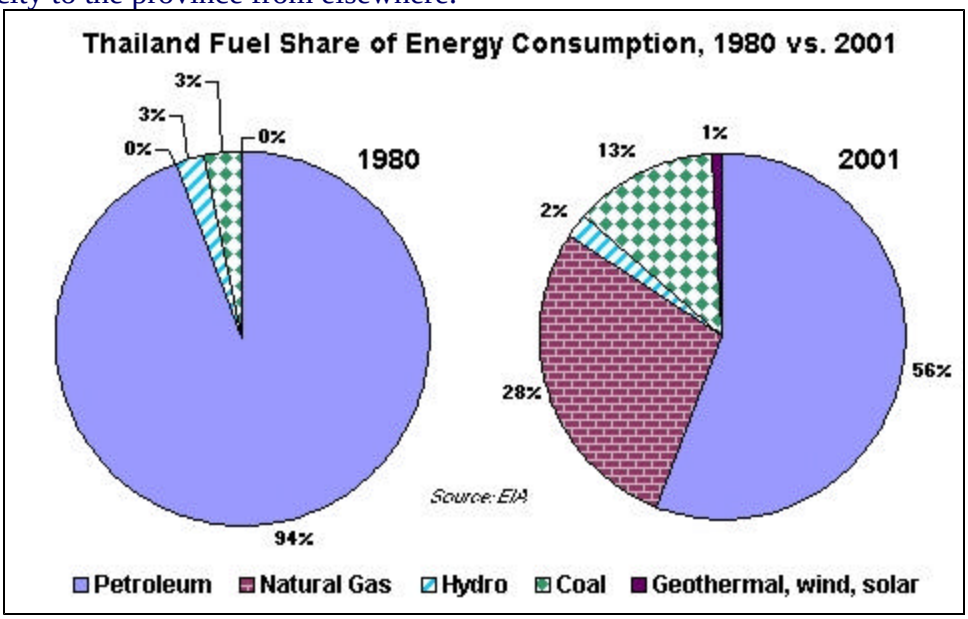
Thailand's energy intensity (energy consumption per $) is on par with energy intensity levels of other countries in southeast Asia. However, the country's energy intensity has nearly doubled since the mid-1980s, following the regional trend among countries in the region that have boosted their energy consumption during the years of rapid economic expansion. The 1997 financial crisis did not slow the increasing level of energy intensity in Thailand, demonstrating the necessity for Thailand to implement energy conservation and efficiency measures.

Similarly, Thailand's carbon intensity (emissions per $) is on the rise, although not at the same rate as the country's energy intensity. Still, the country's carbon intensity has become more pronounced since the start of the 1990s, with increases in industrial development matched by growth in carbon emissions, as well as greater vehicle exhaust with the boom in motor vehicles. The contraction of Thailand's economy in the wake of the 1997 financial crisis did, however, result in a downturn in the country's carbon intensity, although this appears to be merely a temporary slowdown as Thailand's economic rebound appears to have put the country's carbon intensity levels back on an upward path.

Renewable Energy

Although renewable energy consumption makes up only about 3% of Thailand's fuel share of energy consumption, with hydropower accounting for the majority of that percentage, alternatives to fossil fuel-fired energy production are making up an increasing share of the country's energy production. Since Thailand does not have the luxury of domestic natural resources on the scale of neighbors such as Malaysia and Indonesia, Thailand is forced to import much of its energy for domestic use. Oil imports cost the Thai government an estimated 300 billion baht ($7.3 billion) each year.

In an effort to reduce this dependence on costly foreign oil, Thailand is turning to another source of energy that the country has in abundant supply: the sun. Thailand is constructing a 42.5 MW solar power plant in the northern province at Mae Hong Son. The plant, which consists of six solar-cell generating units, will be the largest solar-powered station in the Association of Southeast Asian Nations (ASEAN) when it is completed in April 2004. EGAT says that the plant, which will have the ability to generate 500 kilowatt-hours (kWh) of power in the first phase but eventually will be able to produce 1,750 kWh, will help meet the growing power demand of tourists in the province. Although EGAT says that production costs for solar-powered electricity are five times as high as that of fossil fuel-fired power, EGAT officials note that construction costs of the Mae Hong Son station were considerably lower than the cost that the government would otherwise have had to spent to transmit electricity to the province from elsewhere.



Solar energy is increasing in importance for Thailand, with the Thai government planning to increase its solar power production capacity to 30 MW by 2006. However, environmentalists say this is a mere fraction of Thailand's solar energy potential; Greenpeace has argued that the country has the ability to meet fully one-third of its electricity demand through renewable energy by 2020, with most of the growth coming from solar energy. Thai citizens are taking solar energy's potential into their own hands, as some 20,000 people at Naresuan University have turned the campus into a "solar city" with such items as minibuses, public phones, and ovens all powered by solar energy. The Thai government also is kicking off a project aimed to supply 300,000 homes with solar cells in a bid to generate additional solar energy.

Increased dependence on hydropower is another goal of the Thai government, with plans to import significant quantities of hydroelectricity from Laos. EGAT holds a 25% stake in the Nam Theun 2 Power Company, an international consortium that is planning to build a 1,070 MW hydropower plant and dam at an estimated cost of $1.1 billion. Thailand, through EGAT, is expected to buy 90% of the power generated by the project over the next 25 years. However, plans for the project were thrown up in the air in July 2003 when Electricite de France (EdF), the French power utility with a

35% stake in Nam Theun 2, announced plans to withdraw from the project. In October 2003, EdF appeared to reverse course by deciding to stay in the project. The hydropower plant, although touted for its supposed renewable energy benefits, also has been criticized for its environmental and social impacts on the local population.

The Thai government has encouraged the production of electricity from non-conventional and renewable resources. The Small Power Producer (SPP) program has led to some very innovative energy projects. One Thai project company is developing power plants fueled by rice husk as a biofuel. The fuel supply comes from the central plains, where there are two or three rice harvests a year. Most of the waste is now burned openly, but the SPP program allows electricity produced by the biofuel plants to be sold to EGAT for transmission and distribution to Thai consumers.

Environmental Outlook

In 1992, Thailand passed the Environmental Protection Act, a law that was heralded as the dawn of environmental awareness in the country. Pursuant to the Environmental Protection Act, Thailand's 1997 constitution requires the government to conduct public hearing and seek the views of local communities before it embarks on development projects that will have an effect on the environment. These environmental impact assessments have made the government accountable for the environmental effects, intended or otherwise, for large infrastructure projects, and public participation is increasingly accepted as a necessary ingredient for sustainable resource management.

Still, the December 2002 Environmental Sustainability Index, which was conducted by the World Economic Forum 2000 to show the state of the environment and how it is affected by human activities, ranked Thailand 46th out of 56 countries. Environmentalists cite Thailand's power environmental performance to the government's lack of will in enforcing existing laws and regulation. They claim that the Natural Resources and Environment Ministry does not have any clout and that the government needs to take a tougher stance to regulate and monitor all developments which impact the environment, from new building projects to increasing traffic consumption. Thailand's economic contraction following from the 1997 financial crisis pushed environmental concerns to the backburner as well.

In addition to the financial burdens imposed upon Thailand's environment, the country also has experienced ongoing problems in the coordination among public institutions responsible for environmental and natural resource management. The legislation passed in the early 1990s was meant to establish a comprehensive framework for the protection of Thailand's environment, but weak regulatory implementation and noncompliance by polluters continue to prevent the country from making meaningful strides in achieving an environmentally sustainable rate of growth.

Concern for Thailand's environment and the country's obligations under international environmental conventions continues to grow. The role of environmental non-governmental organizations (NGOs) is steadily increasing, while the process of decentralizing the government's role in formulating local environmental policy decisions also is beginning to take hold. Nevertheless, Thailand continues to have a considerable amount of work to do pertaining to its environment. Working with organizations such as the World Bank and UNEP, the Thai government is taking measures to restructure the management of its natural resources. The existing regulatory command-and-control regime has also been a major source of debate as it has shown to be ineffective, and is slowly being replaced by the introduction of market-based instruments. In addition, direct pressure from many Thai communities affected by pollution is playing a role in influencing the government and the private sector to improve their compliance with environmental regulations.

As Thailand's economy recovers from the disastrous 1997 financial crisis, the Thai government is trying to pursue policies that facilitate new investments to rebuild the country's industrial base while at the same time improving Thailand's environment. With renewed economic growth, the country is facing a challenge similar to that in many developing countries: how to de-link deleterious environmental impacts from economic development. Thailand's financial crisis brought to a screeching halt the country's rapid industrialization and impressive growth, but it also brought into the spotlight the negative environmental impacts that had accompanied that economic expansion. Thailand's environmental initiatives in recent years have been admirable, but improved enforcement of existing laws and regulations will be necessary in order for the country's economic growth to be sustainable.

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